

FOOD HABITS OF WILD UNGULATES AND THEIR COMPETITION WITH LIVESTOCK IN PENCH WILDLIFE RESERVE, CENTRAL INDIA¹

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Key words: Wild ungulates, livestock, overlap, competition

Food habits of a few wild ungulate species and the competing domestic ungulates are discussed. The selected species are chital (*Axis axis*), sambar (*Cervus unicolor*), nilgai (*Boselaphus tragocamelus*) and gaur (*Bos gaurus*). Grazing by livestock is allowed at the study sites I and II, and there is overlap of the two classes of ungulates in their food habits. This may lead to the degradation of wildlife habitat as the livestock outnumber the wild ungulates considerably.

INTRODUCTION

Increasing competition for food between livestock and wild ungulates in managed forests and wildlife reserves is a serious threat to effective wildlife management in India. Due to gradual shrinkage in wildlife habitats and their increase in numbers, domestic livestock compete with wild ungulates by encroaching upon the habitats previously utilized by wild ungulates only. When this occurs in a wildlife reserve, managed exclusively for wild animal populations, it leads to over-exploitation of wildlife habitats.

Comparative studies of the food habits of wild and domestic ungulates have been carried out in different habitats by a number of workers to assess the impact of competition (Mackie 1970, Berwick 1974, Dusek 1975, Dinerstein 1979). This paper deals with the seasonal food habits of common wild ungulates and their competition with domestic cattle in central Madhya Pradesh.

STUDY AREA AND METHODS

The study area, comprising three adjoining areas of different conservation status, the Rukhar Reserved Forest, the Pench Wildlife Sanctuary

and the Pench National Park, is situated in Seoni dist., Madhya Pradesh. The study sites were designated site I (15.8 km²), site II (10.5 km²) and site III (12.7 km²). Grazing by livestock was allowed at site I, regulated at site II, and banned at site III.

According to Champion and Seth (1968), the forests of Pench area are of 3 types:

3B/C1c. South Indian Moist Deciduous Slightly Moist Teak forests.

5A/C1b (IV). Southern Tropical Dry Deciduous Teak forests

5A/C3. Southern Dry Mixed Deciduous forests

However, we identified only two forest types, i.e. teak deciduous and miscellaneous deciduous.

Food habits of the wild and domestic ungulates were observed. The multicolumn check sheet (Duggan 1978) for data collection included the broad categorisation of the vegetation and food types. After observing the feeding ungulates through binoculars (10 x 50), on-site inspections of the food plants were made to identify the plant species. A herbarium of the unidentifiable species was prepared for later identification by botanists. On the basis of the frequency of specific plants being eaten by both classes of ungulates, they were categorized into high, medium and low preference. The study was conducted between 1987-1989.

¹Accepted June, 1998

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RESULTS AND DISCUSSION

Food preference categories of wild and domestic ungulates are presented in Table 1. The chital was a grazer under better forage conditions. Dinerstein (1979) opined that chital was a willing browser utilising a wide variety of tree and shrub species, but the bulk of its diet was composed of grasses and sedges. Schaller (1967) also found chital to be a grazer. As the annual grasses attained maturity and turned coarse, and the forage conditions became poor in the study area, the chital switched over to selective and consistent browsing. The most preferred food plants for chital during the rains were grass species, *Heteropogon contortus*, *Dichanthium annulatum*, *Bothriochloa odorata*, *Iseilema laxum* and *Themeda quadrivalvis*. Among the preferred forbs were *Alysicarpus bupleurifolius*, *Asparagus racemosus* and *Crotalaria medicaginea*. When the forage conditions worsened during the late winter and summer, the bulk of the diet consisted of *Themeda quadrivalvis*, *Bothriochloa odorata*, *Imperata cylindrica* and *Eragrostis uniloides*. Leaves and flowers of *Madhuca indica*, *Syzygium cumini*, *Bridelia retusa*, *Bauhinia racemosa*, *Diospyros melanoxylon*, *Emblica officinalis*, *Flemingia semialata* and shoots of *Elephantopus scaber* and *Urena lobata* were also fed upon by the chital. Schaller (1967) observed that due to the diminished food value of the grass species, they were utilized prior to the end of the rains.

Sambar also fed on green grasses in favourable habitat conditions. Schaller (1967) recorded that they preferred grasses and sedges from June through October. Unlike in mature sal forest associations (Dinerstein 1979) when the habitat conditions in the study area restricted the preferred forage, sambar fed on a wider variety of plants (Table 1). Forsyth (1889) mentioned that during unfavourable forage conditions, it fed on a variety of leaves, pods, flowers and fruit. Sambar were frequently observed feeding on

aquatic plants in shoulder-high water in the Dudhia tank at site I.

The gaur grazed and browsed on a much wider variety of plants than any other ungulate species in the study area. It fed on green grasses, young leaves and soft shoots during favourable forage conditions. Owing to its large body size, a single food item is not likely to form a large proportion of its daily intake. The gaur hardly differentiated between the low and high quality food during the pinch period in the hottest month, as it also fed on coarse grasses and the bark of young *Tectona grandis* trees. In general, the gaur appeared to be the least selective feeder.

The nilgai in the study area were also grazer/browser. They raided the agricultural crops around the study area during the late evenings or nights. Food habits of the nilgai were considerably different from those of the chital and sambar. Dinerstein (1979) mentioned that apart from a shared attraction to agricultural crops, nilgai and chital differ considerably in their feeding habits. During the rains and the early winter, when forage conditions were favourable, the nilgai also fed on a variety of browse plants. Being larger in size, more browse was easily accessible to the nilgai and it frequently browsed on trees such as *Bauhinia racemosa*, *Bauhinia vahlii*, *Zizyphus mauritiana*, *Zizyphus xylopyra* and *Randia dumetorum* (Table 1).

Domestic ungulates, regarded primarily as grazers (Berwick 1974), also browsed on several plant species in the study area (Table 1) during the hot season. Grasses and sedges were mainly eaten during favourable forage conditions. With grasses turning coarse and dry, livestock shifted to browsing to some extent until the onset of the monsoon. The livestock of many villages on the periphery of the study sites I and II, which have a good wildlife potential, outnumber the wild ungulates considerably. This overlap of two classes of ungulates in food habits may result in serious competition, leading to the degradation of otherwise fine wildlife habitats.

FOOD HABITS OF WILD UNGULATES IN PENCH WILDLIFE RESERVE

TABLE I
USAGE OF PLANT SPECIES BY WILD AND DOMESTIC UNGULATES IN
DIFFERENT SEASONS IN PENCH WILDLIFE RESERVES

Plant species	Part eaten	Preference					Season
		Chital	Sambar	Gaur	Nilgai	Livestock	
Grasses/Sedges							
<i>Bothriochloa odorata</i>	S	★★	★★	★★	★	★★★	RWS
<i>Cynodon dactylon</i>	S	★★★	★★★	★★★	★★★	★★★	RWS
<i>Dichanthium annulatum</i>	S	★★★	★★★	★★★	★★★	★★★	RWS
<i>Eragrostis uniloides</i>	S	★★	★★	★★★	★★	★★★	RWS
<i>E. viscosa</i>	S	★	★	★★	-	-	R
<i>Heteropogon contortus</i>	S	★★★	★★★	★★★	★★★	★★★	R
<i>Imperata cylindrica</i>	S	★	★	★★	★	★★	RWS
<i>Iseilema laxum</i>	S	★★	★★	★★	★	★	RW
<i>Panicum montanum</i>	S	★	★	★★	★	★	RWS
<i>Saccharum spontaneum</i>	S	★★	★★★	★★★	★★	★	RW
<i>Setaria glauca</i>	S	★	★	★★	★	-	RW
<i>S. tomentosa</i>	S	★	-	★★	★	★★	RW
<i>Sporobolus diander</i>	S	-	★	★	-	-	RW
<i>Themeda triandra</i>	S	★★★	★★★	★★★	★★★	★★★	RWS
<i>T. quadrivalvis</i>	S	★★	★★★	★★★	★	★★	RWS
<i>Cyperus rotundus</i>	S	★	★	-	-	★	RW
Forbs							
<i>Alysicarpus bupleurifolius</i>	S	★★	-	-	-	-	R
<i>Asparagus racemosus</i>	L	★★	-	-	-	-	R
<i>Cassia pumila</i>	S	★	★	★★	-	★	RW
<i>Crotalaria medicaginea</i>	L	★	★	★★	★	-	R
<i>Celosia argentea</i>	L	★	★	★★	-	-	RW
<i>Desmodium triflorum</i>	L	-	-	★★	-	-	RW
<i>Elephantopus scaber</i>	L	★★	★★	★	-	-	RW
<i>Phoenix acaulis</i>	L	★	★	★★	★	-	RWS
<i>Smilax proliferata</i>	L	★	★	-	★	★	RW
<i>Sida rhombifolia</i>	L	★	-	★	★	★	W
<i>Urena lobata</i>	L	-	-	-	★★	-	W
Seedling/Saplings							
<i>Adina cordifolia</i>	B ¹ ,L,F	★	-	★	★	-	WS
<i>Aegle marmelos</i>	L	★★	★	-	★★	★★	RW
<i>Buchanania lanzen</i>	F	★	-	★	★	★	S
<i>Bridelia retusa</i>	L	★	-	-	-	-	RW
<i>Bauhinia racemosa</i>	L,F	★	-	-	★★	★	WS
<i>B. vahlii</i>	L,F	★★	★★	★★	★	★★	WS
<i>Cassia fistula</i>	L	★	-	★	★	-	WS
<i>Cordia myxa</i>	L	★	★	★★	★	-	S
<i>Careya arborea</i>	F	★	★	★★	★★	-	R
<i>Dioscorea bulbifera</i>	L	★★	★	-	★	-	RW
<i>Dendrocalamus strictus</i>	L	★★	★★	★★★	★★	★★	RWS
<i>Diospyros melanoxylon</i>	L,F	★	★	★★	★	-	WS
<i>Emblica officinalis</i>	L,F	★	★	-	★	-	RW
<i>Flemingia semialata</i>	L	★	★★	★★★	★	★★	RWS
<i>F. bracteata</i>	L	★★	★★	★★★	★★	★	RWS
<i>Ficus bengalensis</i>	F	★★	★	★★	★	★	S
<i>F. glomerata</i>	F	★	-	★	★	★	S

(CONTD.)

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TABLE I (CONTD.)
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Plant species	Part eaten	Preference					Season
		Chital	Sambar	Gaur	Nilgai	Livestock	
<i>Kydia calycina</i>	S	★	★	★★	★★	-	WR
<i>Lagerstroemia parviflora</i>	L	★	-	★★	★	-	WS
<i>Madhuca indica</i>	L,F	★★★	★	★★★	★	★	WS
<i>Mitragyna parvifolia</i>	L	★★	★	-	★	-	R
<i>Randia dumetorum</i>	L,F	★	-	★	★	-	RW
<i>Semecarpus anacardium</i>	F	★	-	★	-	-	W
<i>Syzygium cumini</i>	L,F	★	★★	★★★	-	★	WS
<i>Tectona grandis</i>	B ¹	-	-	★	-	-	S
<i>Terminalia tomentosa</i>	L	★	-	★	★	-	RW
<i>T. bellerica</i>	L	★	★	-	★	-	W
<i>Zizyphus rotundifolia</i>	L,F	★★★	★★	★★★	★★	-	WS
<i>Z. mauritiana</i>	L,F	★★	★	★★	★★	-	W
<i>Z. xylopyra</i>	L,F	★★	★	★	★★	-	S

1= Eaten by the gaur only

Seasons: R = Rains

Preference: ★ = Low

Parts eaten: S = Shoots

W = Winter

★★ = Medium

L = Leaves

S = Summer

★★★ = High

F = Fruit

B = Bark

ACKNOWLEDGEMENTS

We are grateful to Dr. R.K. Pandey, Forest Botanist and Dr. J.L. Shrivastava,

Scientist, of the S.F.R.I. Jabalpur for their help in identifying plant species in the study area.

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